UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/988,937	11/19/2001	Ralf Bohnke	282663US8X	9361

22850   7590   04/23/2008
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER
DEAN, RAYMOND S

ART UNIT	PAPER NUMBER
2618	

NOTIFICATION DATE	DELIVERY MODE
04/23/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _14 April 2008_.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _18-28_ is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) _18-28_ is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on _19 November 2001_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☒ All   b)☐ Some * c)☐ None of:
      1.☒ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____.
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments, see remarks filed April 14, 2008 with respect to the

rejection(s) of claim(s) 18, 25, 26 under 35 U.S.C. 103(a) have been fully considered

and are persuasive. Therefore, the rejection has been withdrawn. However, upon

further consideration, a new ground(s) of rejection is made in view of a further reading

of the previously cited reference Keller.

Keller teaches an OFDM system wherein a particular modulation scheme is

designated for a particular block of subcarriers comprising a particular number of

subcarriers thus rendering a scenario wherein there is: a lower modulation scheme such

as BPSK for a first block of subcarriers, a standard modulation scheme such as QPSK

for a second block of subcarriers, and a higher modulation such as 16 QAM for a third

block of subcarriers. The modulation designation is based on the channel transfer

function thus as the channel characteristics change there is a corresponding change in

the channel transfer function and a corresponding change in the modulation

designation, which makes said modulation designation adaptive. The modulation

designation is determined or calculated before the transmission of the next OFDM

symbol thus there will need to be storage of said modulation designation in memory

prior to the time of actual transmission of said next OFDM symbol. The storage space

in memory is a table thus rendering a feature of predetermining or pre-calculating the

loading, which is the modulation designation, table. Since said loading is stored in the

memory space, which is the table, there is pre-calculation of a loading table. The

modulation designation, as set forth above, is adaptive thus rendering a plurality of

loading tables (See Keller, II Adaptive Modulation for OFDM, Section C Channel

Estimation, Section D Choice of the Modulation Scheme).

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed
> publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3.   Claims 18 – 28 are rejected under 35 U.S.C. 102(a) as being anticipated by

Keller et al. (Vehicular Technology, IEEE Transactions on, Volume: 49, Issue: 5, Sept

2000, Pages: 1893 – 1906).

Regarding Claim 18, Keller teaches a wireless multi-carrier transmission method,

wherein a multi-carrier transmission uses n modulated frequency sub carriers (n is an

integer number), a fading condition of each sub carrier is detected to generate fading

channel profile information (Section II (A. System Model), Section II (D. Choice of the

Modulation Scheme, First Paragraph)), the modulation of each sub carrier is determined

by the following steps: pre-calculating a plurality of adaptive loading tables, each

loading table containing x sub carriers for modulation with a lower modulation scheme, y

sub carriers for modulation with a standard modulation scheme, and z sub carriers for

modulation with a higher modulation scheme (x, y, and z are integer numbers) (Section

II Adaptive Modulation for OFDM, Section C Channel Estimation, Section D Choice of

the Modulation Scheme, See Response To Arguments above); wherein the sum of x, y,

and z is n and a resulting number of coded bits of a multi-carrier symbol is constant

(Section II (D. Choice of the Modulation Scheme, Second Paragraph, Section II (A.

System Model, Second Paragraph lines 22 – 23, Third Paragraph lines 1 - 4), Section II

(D. Choice of the Modulation Scheme, Section 1, Third Paragraph lines 10 – 16),

Section II (F. Sub band Adaptive OFDM and Channel Coding, First Paragraph lines 8 –

13), a desired SNR determines a particular BER which further determines a particular

throughput or number of bits per symbol, said throughput or number of bits per symbol

corresponds to a particular modulation scheme); selecting one of the adaptive loading

tables for said multi-carrier transmission (Section II Adaptive Modulation for OFDM,

Section C Channel Estimation, Section D Choice of the Modulation Scheme, See

Response To Arguments above); and modulating the x sub carriers having low fading

channel profile information with the lower modulation scheme, modulating the y sub

carriers having medium fading channel profile information with the standard modulation

scheme, and modulating the z sub carriers having high fading channel profile

information with the higher modulation scheme (Section II (A. System Model), Section II

(D. Choice of the Modulation Scheme, First and Second Paragraph, Section 1, Third

Paragraph lines 10 – 16)).

Regarding Claim 19, Keller teaches all of the claimed limitations recited in Claim

18. Keller further teaches wherein the transmission power of the sub carriers are

adapted such that the total transmission power of all sub carriers remains unchanged

(Section II (A. System Model, Second Paragraph Equation (2)), the overall SNR K

comprises the SNRs of all of the sub carriers K sub n, said SNRs K sub n are directly

dependent on the transmission power of the sub carriers n thus when a particular

overall SNR K is desired the transmission power of said sub carriers n will be adapted

to achieve said desired SNR K).

Regarding Claim 20, Keller teaches all of the claimed limitations recited in Claim

19. Keller further teaches the transmission power of sub carriers having a higher

modulation scheme is enhanced to compensate for sub carriers which are not

modulated (Section II (D. Choice of the Modulation Scheme, First Paragraph), Section II

(A. System Model, Second Paragraph Equation (2)), the overall SNR K comprises the

SNRs of all of the sub carriers K sub n, said SNRs K sub n are directly dependent on

the transmission power of the sub carriers n thus when a particular overall SNR K is

desired the transmission power of said sub carriers n will be adapted to achieve said

desired SNR K, when a plurality of said sub carriers n are not modulated there will be

no transmission of said sub carriers n thus the transmission power of the modulated sub

carriers n will be modified to compensate for the transmission power loss caused by the

said non modulated sub carriers n such that said desired SNR K is still achieved).

Regarding Claim 21, Keller teaches all of the claimed limitations recited in Claim

18. Keller further teaches adaptive loading information reflecting the adaptation of the

modulation scheme of the sub carriers is exchanged between a transmitter and a

receiver of the multi-carrier transmission (Figure 1a, Figure 1b, Section I Paragraphs 5

and 6).

Regarding Claim 22, Keller teaches all of the claimed limitations recited in Claim

21. Keller further teaches the receiver calculates a suitable loading based on received

signals, - the receiver sends the adaptive loading information in a signaling field and

uses the calculated adaptive loading in the data field of a transmitted data train (Figure

1b, Section I Paragraph 5 lines 18 – 21, Section I Paragraph 6 lines 33 – 38, this is a

packet based wireless system thus there will be a data train comprising data fields).

Regarding Claim 23, Keller teaches all of the claimed limitations recited in Claim

18. Keller further teaches a plurality of sub carriers is bundled into groups and the

same modulation scheme is applied for all sub carriers belonging to the same group

(Section II (D. Choice of Modulation Scheme, Second Paragraph lines 1 – 6)).

Regarding Claim 24, Keller teaches all of the claimed limitations recited in Claim

23. Keller further teaches a plurality of adjacent sub carriers is bundled into one group

(Section II (D. Choice of Modulation Scheme, Second Paragraph lines 1 – 6)).

Regarding Claim 25, Keller teaches a computer readable medium for storing

therein a computer software program running on a wireless transmitting device (Figure

1a, Figure 1b, Section I Paragraphs 5 and 6, this shows a mobile station and base

station configured to employ the AOFDM algorithm, a mobile station comprises wireless

transmitting devices such as wireless phones and mobile computers, said

phones/computers comprise CPUs that control the operation of said phones/computers,

there is software that runs on board said CPUs that enable said CPUs to carry out the

required functions, the mobile stations of the AOFDM system will therefore comprise

CPUs with on board software that enables said CPUs to run the said AOFDM algorithm,

said software is stored in memory such as RAM) for executing wireless multi-carrier

transmission multi-carrier that uses n modulated frequency sub carriers (n is an integer

number), a fading condition of each sub carrier is detected to generate fading channel

profile information (Section II (A. System Model), Section II (D. Choice of the Modulation

Scheme, First Paragraph)), the program determines the modulation of each sub carrier

by the following steps: pre-calculating a plurality of adaptive loading tables, each

loading table containing x sub carriers for modulation with a lower modulation scheme, y

sub carriers for modulation with a standard modulation scheme, and z sub carriers for

modulation with a higher modulation scheme (x, y, and z are integer numbers) (Section

II Adaptive Modulation for OFDM, Section C Channel Estimation, Section D Choice of

the Modulation Scheme, See Response To Arguments above); wherein the sum of x, y,

and z is n and a resulting number of coded bits of a multi-carrier symbol is constant

(Section II (D. Choice of the Modulation Scheme, Second Paragraph, Section II (A.

System Model, Second Paragraph lines 22 – 23, Third Paragraph lines 1 - 4), Section II

(D. Choice of the Modulation Scheme, Section 1, Third Paragraph lines 10 – 16),

Section II (F. Sub band Adaptive OFDM and Channel Coding, First Paragraph lines 8 –

13), a desired SNR determines a particular BER which further determines a particular

throughput or number of bits per symbol, said throughput or number of bits per symbol

corresponds to a particular modulation scheme); selecting one of the adaptive loading

tables for said multi-carrier transmission (Section II Adaptive Modulation for OFDM,

Section C Channel Estimation, Section D Choice of the Modulation Scheme, See

Response To Arguments above); and modulating the x sub carriers having low fading

channel profile information with the lower modulation scheme, modulating the y sub

carriers having medium fading channel profile information with the standard modulation

scheme, and modulating the z sub carriers having high fading channel profile

information with the higher modulation scheme (Section II (A. System Model), Section II

(D. Choice of the Modulation Scheme, First and Second Paragraph, Section 1, Third

Paragraph lines 10 – 16)).

Regarding Claim 26, Keller teaches a wireless multi-carrier transmission device

for a multi-carrier transmission uses n modulated frequency sub carriers (n is an integer

number) (Figure 1a, (Section II (A. System Model)), comprising: a fading channel profile

unit for detecting a fading condition of each sub carrier (Figure 1a, the channel quality is

determined thus there will be a fading channel profile unit for detecting a fading

condition); adaptive loading calculation unit for pre-calculating a plurality of adaptive

loading tables, each adaptive loading table containing x sub carriers for modulation with

a lower modulation scheme, y sub carriers for modulation with a standard modulation

scheme, and z sub carriers for modulation with a higher modulation scheme (x, y, and z

are integer numbers) (Section II Adaptive Modulation for OFDM, Section C Channel

Estimation, Section D Choice of the Modulation Scheme, See Response To Arguments

above); wherein the sum of x, y, and z is n and a resulting number of coded bits of a

multi-carrier symbol is constant (Section II (D. Choice of the Modulation Scheme,

Second Paragraph, Section II (A. System Model, Second Paragraph lines 22 – 23, Third

Paragraph lines 1 - 4), Section II (D. Choice of the Modulation Scheme, Section 1, Third

Paragraph lines 10 – 16), Section II (F. Sub band Adaptive OFDM and Channel Coding,

First Paragraph lines 8 – 13), a desired SNR determines a particular BER which further

determines a particular throughput or number of bits per symbol, said throughput or

number of bits per symbol corresponds to a particular modulation scheme); selecting

means for selecting one of the adaptive loading tables for said multi-carrier transmission

(Section II (D. Choice of the Modulation Scheme, First and Second Paragraph), Section

3), 2nd – 4th paragraphs, See Also Response To Arguments above); and an adaptive

bits-to-symbol mapping unit for modulating x sub carriers having low fading channel

profile information with the lower modulation scheme, modulating the y sub carriers

having medium fading channel profile information with the standard modulation scheme,

and modulating the z sub carriers having high fading channel profile information with the

higher modulation scheme (Section II (A. System Model), Section II (D. Choice of the

Modulation Scheme, First and Second Paragraph, Section 1, Third Paragraph lines 10 –

16)).

Regarding Claim 27, Keller teaches all of the claimed limitations recited in Claim

26. Keller further teaches the adaptive loading calculation unit bundles respectively a

plurality of sub carriers into groups and applies the same modulation scheme on all sub

carriers belonging to the same group (Section II (D. Choice of Modulation Scheme,

Second Paragraph lines 1 – 6)).

Regarding Claim 28, Keller teaches all of the claimed limitations recited in Claim

27. Keller further teaches the adaptive loading calculation unit (8) bundies a plurality of

adjacent sub carriers into one group (Section II (D. Choice of Modulation Scheme,

Second Paragraph lines 1 – 6)).

Conclusion

4.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to RAYMOND S. DEAN whose telephone number is (571)272-7877. The examiner can normally be reached on Monday-Friday 6:00-2:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F. Urban can be reached on 571-272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Raymond S Dean/   Raymond S. Dean
Primary Examiner, Art Unit 2618   April 17, 2008